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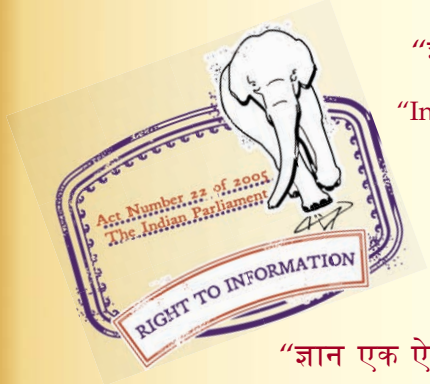
IS 4502 (1999): Machine Vices [PGD 2: Machine Tool Elements and Holding Devices]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 4502 : 1999
(Reaffirmed 2004)

भारतीय मानक

मशीनी शिकंजे—विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

MACHINE VICES — SPECIFICATION

(First Revision)

ICS 25.100.20

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 1999

Price Group 3

Machine Tool Elements and Holding Devices Sectional Committee, PE 02

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Machine Tool Elements and Holding Devices Sectional Committee had been approved by the Production Engineering Division Council.

This Indian Standard was first issued in 1968 and the present revision has been taken up to bring the standard in line with the current manufacturing practices.

This standard has been prepared with a view to assist the industry in obtaining uniformity in various types of machine vices being manufactured in the country.

Machine vices are employed on machine tools like milling machines, drilling machines and surface grinding machines, to hold the work piece securely in position for machining. The machine vice is located either parallel or square to the T-slot of the machine table by means of a pair of tenons, fixed in the tenon-slot of the machine vice base, and then clamped to the table by means of T-bolts and nuts.

Tenon slot of width 20H8 is selected for all sizes of machine vices in line with IS 2990 : 1986 'Dimensions for tennons (*first revision*)'.

As a guidance to both the manufacturer and user in selecting a suitable machine vice, clamping range and the corresponding recommended sizes have been given in Tables 1 and 2.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed, or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

MACHINE VICES — SPECIFICATION

(First Revision)

1 SCOPE

This standard covers the dimensions, general requirements and permissible errors of push or pull type machine vices with fixed or swivel base.

2 REFERENCES

2.1 The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
28 : 1985	Phosphor bronze ingots and castings (*fourth revision*)
210 : 1993	Grey iron castings (*fourth revision*)
1367 (Part 3) : 1991	Fasteners — Threaded steel — Technical supply conditions : Part 3 Mechanical properties and test methods for bolts, screws and studs with full loadability (*third revision*)
1570 : 1961	Schedules for wrought steels for general engineering purposes
1865 : 1991	Iron castings with spheriodal or nodular graphite (*second revision*)
2908 : 1964	Dimensions for hand cranks
10949 : 1984	Code of practice for painting procedure for machine tools

3 NOMENCLATURE

3.1 For the purpose of this standard, the nomenclature given in figures in Tables 1 and 2 shall apply.

4 MATERIAL

4.1 The base and sliding and fixed jaws shall be made of cast iron of grade FG 260 as specified in IS 210 or suitable quality of SG iron as per IS 1865.

4.2 Spindle screw shall be made from suitable quality steel having a minimum tensile strength of 600 MPa. Its tang shall be hardened to 450 HV *Min* ($\simeq$ 45 HRC *Min*).

4.3 Spindle nut shall be made from phosphor bronze as per grade 1 of IS 28.

4.4 Jaw inserts shall be made of suitable quality tool steel, such as T 110W2Cr1 of Schedule VI of IS 1570, hardened to 620 $\pm$ 40 HV (56 $\pm$ 2 HRC) or any other suitable case-hardening steel. The jaw faces shall be smooth and ground flat.

4.5 Fasteners used shall be of property class 8.8 of IS 1367 (Part 3).

5 DIMENSIONS

5.1 The dimensions of fixed base and swivel base machine vices shall be as given in Tables 1 and 2 respectively.

5.2 The dimensions for jaw inserts for machine vices shall be as given in Table 3.

6 GENERAL REQUIREMENTS

6.1 The jaw inserts shall be rigidly fixed to the jaws of the machine vices. The method of fixing the jaw is left to the discretion of the manufacturer.

6.2 The same jaw inserts shall be specified for machine vices with fixed base and swivel base and for both fixed and sliding jaws.

6.3 All non-machined portions of the machine vices shall be painted according to procedure laid down in IS 10949.

6.4 Each machine vice shall be supplied with a suitable hand cranks specified in IS 2908. Fixed base machine vices with nominal sizes up to 125 mm may also be supplied with hand grips.

7 DESIGNATION

7.1 Machine vices shall be designated by their name, nominal size and number of this standard.

Example

A pull type machine vice with swivel base having a nominal size

b = 100 mm shall be designated as:

Pull Type Machine Vice Swivel Base IS 4502 100

8 TESTS AND ACCURACIES

8.1 The tests and permissible errors of the machine vices shall be as given in Table 4.

9 MARKING

9.1 Machine vices shall be marked with the nominal size and the manufacturer's name or his registered trade-mark.

9.2 BIS Certification Marking

The product may also be marked with Standard Mark.

9.2.1 The use of the Standard Mark is governed by the provision of *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark May be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

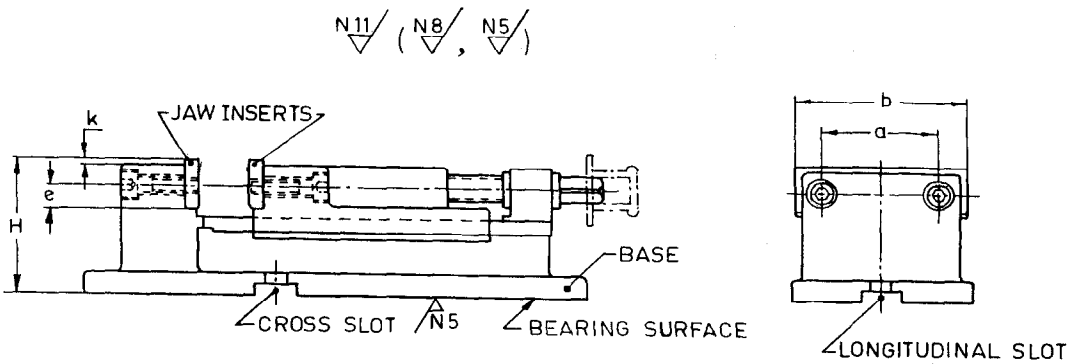
10 PACKING

10.1 Machine vices shall be coated with a suitable rust preventive coating and packed in such a way as not to be affected by the exposure to atmosphere.

Table 1 Dimensions for Fixed Base Machine Vices

(*Clauses* 3.1 *and* 5.1)

All dimensions in millimetres.

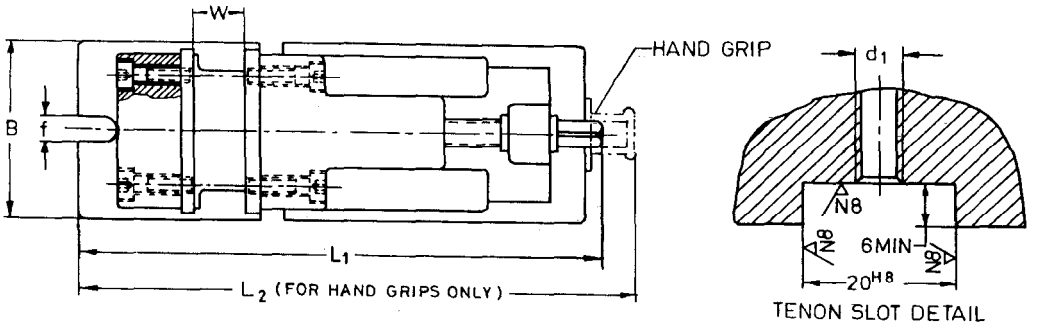


Nominal Size	50	63	80	100	125	160	200	250	315
b Clamping Range	0 to 32	0 to 40	0 to 50	0 to 63	0 to 80	0 to 100	0 to 125	0 to 160	0 to 200
W Min									
L_1 *Max*	175	200	240	320	400	480	560	650	700
L_2 *Max*	215	250	300	375	400	–	–	–	–
B Max	100	125	140	180	200	240	280	350	425
H Max	72	80	90	100	120	130	150	200	240
a Nom	35	45	56	63	80	100	125	160	200
a Tol			± 0.1					± 0.15	
e Nom	8	10	12	14	16	20	25	32	40
e Tol			± 0.1					± 0.15	
k Max	2	2	3	3	4	4	6	6	6
f	10	10	12	14	14	18	18	18	18
d_1	M6	M6	M6	M6	M6	M6	M6/M8	M6/M8	M6/M8

Table 2 Dimensions for Swivel Base Machine Vices

(*Clauses* 3.1 *and* 5.1)

All dimensions in millimetres.

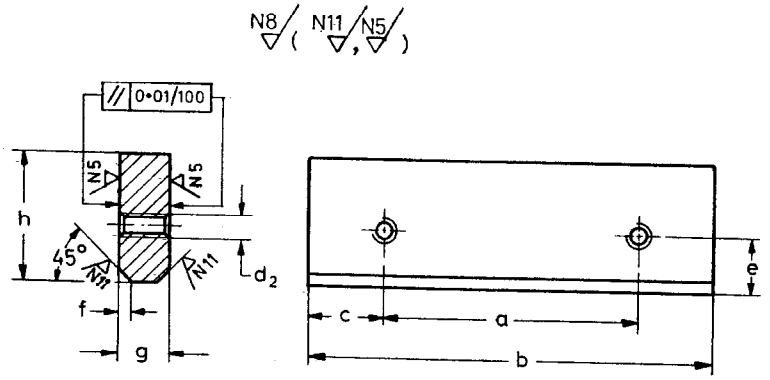


Nominal Size	50	63	80	100	125	160	200	250	315
b Clamping Range	0 to 32	0 to 40	0 to 50	0 to 63	0 to 80	0 to 100	0 to 125	0 to 160	0 to 200
W Min									
L Max	200	240	280	360	450	520	600	700	760
B Max	125	150	165	210	240	280	320	400	475
H Max	100	110	125	140	160	180	220	280	320
a Nom	35	45	56	63	80	100	125	160	200
Tol			± 0.1					± 0.15	
e Nom	8	10	12	14	16	20	25	32	40
Tol			± 0.1					± 0.15	
k Max	2	2	3	3	4	4	6	6	6
f	10	10	12	14	14	18	18	18	18
d_1	M6	M6	M6	M6	M6	M6	M6/M8	M6/M8	M6/M8

Table 3 Dimensions for Jaw Inserts for Machine Vices

(*Clause* 5.2)

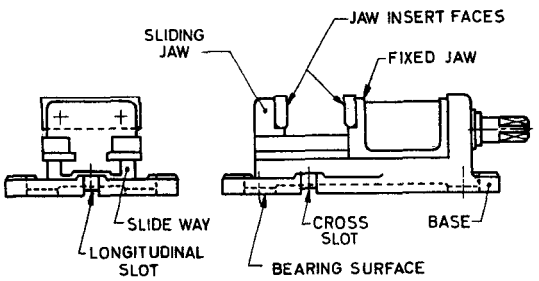
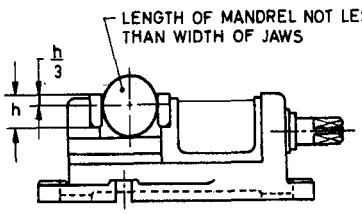
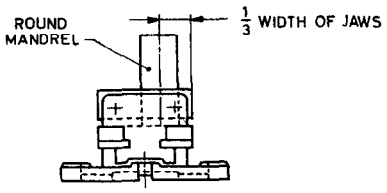
All dimensions in millimetres.



Nominal Size	50	63	80	100	125	160	200	250	315
b									
Nom	35	45	56	63	80	100	125	160	200
a									
Tol			± 0.1					± 0.15	
c	7.5	9	12	18.5	22.5	30	37.5	45	57.5
d_2	M5	M6	M8	M8	M10	M10	M12	M16	M16
Nom	8	10	12	14	16	20	25	32	40
e									
Tol			± 0.1					± 0.15	
f	1	2	2	3	4	5	5	5	6
Nom	6	8	8	12	12	16	20	20	25
g									
Tol			−0.5	−1					
h	16	20	25	32	40	50	63	80	100

Table 4 Test Chart for Machine Vices

(*Clause* 8.1)

Sl No.	Test Item	Figures	Permissible Error
i)	Flatness of bearing surface		0.02 mm
ii)	Slide way parallel to bearing surface		
iii)	Slide way parallel to longitudinal slot		
iv)	Cross slot square to longitudinal slot when checked with a standard square		0.02/100 mm
v)	Fixed jaw insert parallel to cross slot		
vi)	Jaw insert faces square to bearing surface when checked with a standard square		
vii)	Jaw insert faces parallel		
viii)	Sliding jaw insert square to bearing surface when vice is clamped (tendency of slide to lift)		0.1/100 mm Load on hand cranks 15 kgf
ix)	Jaw insert faces parallel when vice is clamped (tendency of slide to cant)		

NOTE — Tests No. (iii) and (v) are not applicable to machine vices with swivel base.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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